

ABSTRACT OF THE DISCLOSURE

This invention relates to the expression of improved polynucleotide and polypeptide sequences encoding for eukaryotic enzymes, particularly oxidase enzymes. The enzymes are advantageously produced in conventional or facile expression systems. Various methods for directed evolution of polynucleotide sequences can be used to obtain the improved sequences. The improved characteristics of the polypeptides or proteins generated in this manner include improved expression, enhanced activity toward one or more substrates, and increased thermal stability. In a particular embodiment, the invention relates to improved expression of the galactose oxidase gene and galactose oxidase enzymes. GAO mutants that are highly active and/or thermostable are disclosed.